

# The biggest problem with air energy storage

Are compressed air energy storage facilities a problem?

The problem is that these compressed-air energy storage (CAES) facilities are considerably more complex in practice than they are in principle. Gas heats up when it is compressed, which limits how much air can be pumped underground before it becomes too hot to be stored safely.

Where can compressed air energy be stored?

The number of sites available for compressed air energy storage is higher compared to those of pumped hydro [1]. Porous rocks and cavern reservoirs are also ideal storage sites for CAES. Gas storage locations are capable of being used as sites for storage of compressed air.

What is compressed air energy storage?

The basic technology behind compressed-air energy storage goes back decades, and can involve pumping air into underground caverns, natural or artificial, then letting it out again. The first underground compressed-air facility was completed in 1978, in Germany; such systems can store and release vast amounts of energy.

What are the disadvantages of a compressed air storage system?

With a rough estimate of 80% of U.S. territory being geologically suitable for CAES, it has the potential to be a leading system within the storing of compressed air energy. One of the main disadvantages associated with this type of storage system is the need for the heating process to cause expansion.

How electrical energy can be stored as exergy of compressed air?

(1) explains how electrical energy can be stored as exergy of compressed air in an idealized reversed process. The Adiabatic method achieves a much higher efficiency level of up to 70%. In the adiabatic storage method, the heat, which is produced by compression, is kept and returned into the air, as it is expanded to generate power.

What is the main exergy storage system?

The main exergy storage system is the high-grade thermal energy storage. The rest of the air is kept in the low-grade thermal energy storage, which is between points 8 and 9. This stage is carried out to produce pressurized air at ambient temperature captured at point 9. The air is then stored in high-pressure storage (HPS).

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To generate power, air is released from the cavern, heated in hot water tanks, and used to power turbines. A similar project is under development by Hydrostor in New South Wales, Australia. - the 200 MW ...